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L1: Entry 1 of 1 File: USPT Dec 18, 1979

DOCUMENT-IDENTIFIER: US 4179739 A

TITLE: Memory controlled process for railraod traffic management

#### <u>Detailed Description Text</u> (23):

In a second memory 9, are stored the instantaneous acceleration or deceleration commands to be applied to the vehicle in relation to the vehicle position px. These commands are also cross-related in the memory 10 to the times tx corresponding to the position px according to the assigned time-table. These acceleration or deceleration commands can be computed a priori and entered in the laboratory. Preferably they are recorded during an experimental run of the vehicle over the corresponding itinerary, according to the procedure illustrated in FIG. 13. During subsequent runs command datum .gamma.ex is extracted from the memory 9 in function of the position coordinate px issued by the dead-reckoning process 3, to which a correction factor corresponding to the product of the speed vx by the response time, TR of the vehicle to acceleration or deceleration commands is added at 8. Command datum .gamma.et is extracted from the memory 10 in function of the time te derived from the clock after adding the response time TR to the time Ti, in 7, so that te=tc+TR-TL. A selector circuit 13 allows .gamma.ex to reach adder circuit 14 only when .gamma.ex value is negative or corresponding to a deceleration command. The command .gamma.et is fed to adder 14 only when it is positive and corresponding to an acceleration command. The command data .gamma.ex and .gamma.et should theoretically be sufficient to allow the vehicle to faithfully duplicate the experimental or theoretical run the characteristics of which have been stored in the memories 2 and 9. However, the inherent inaccuracy of the various organs of the vehicles would tend to cause a drift away from the time-table schedule. An additional acceleration or deceleration component .qamma.x is thus generated in 12 in function of the time error .DELTA.tx according to the formula:

#### <u>Detailed Description Text</u> (28):

It should be noted that the wheel-revolution counter and the accelerometer constitute two measurement techniques which appropriately complement one another. The accelerometer usually gives a reliable measure but its twice integrated output signal is subject to drifting. It is known that during periods of high acceleration or on uphill ramps, the traction wheels of a vehicle are subject to spinning. During the deceleration process the wheels are subject to skidding. The revolutioncounter is thus a poor gauge of the distance travelled during these periods; but can safely be relied upon during long periods of constant speed or of low power application, to provide precise measurement on the basis of which the accelerometer can be recalibrated. The increment selector 23 operates in function of the raw, absolute value of acceleration and gives more weight to distance increments from the wheel revolution-counter in inverse proportion to the amplitude of the accelerometer output. A comparator circuit 22 is further added in order to generate a correction factor for the accelerometer and the speed indicator 26 in function of the error detected between pc and py during periods when the wheel revolutioncounter can be expected to yield very reliable data.

#### Detailed Description Text (34):

The wheel circumference  $\underline{factor}$  W (multiplied in 32 by the number of revolutions N

indicated by the counter 15) is quasicontinually adjusted by a minute <u>correction</u> factor .epsilon. added to it at 33. The <u>correction factor</u> .epsilon. is a function of the correction C applied to the display register 25 upon detection of a check point. This correction is computed in the correction circuit 31. A low-pass, integrating type filter 30 may be advantageously installed between the circuit 31 and the adder circuit 33 in order to stabilize the corrective system loop. The exact location coordinates pex of each check point Ex can be determined by survey and written into the memory 17 in the laboratory. These coordinates can also be recorded during an experimental run according to the following procedure.

#### Detailed Description Text (39):

When identity of signals is found between the information extracted from the memory 17 and the information issued by the sensing equipment 38-39, the corresponding location coordinate Pxn which lies between Pxm and Pxr is transmitted to the correction factor generator circuit 36. In the correction factor generator circuit 36, the location coordinate Pxn is compared to the estimated location px and a correction value C is generated according to a function similar to that illustrated by curve C of FIG. 8. The correction value is then added at 37 to the estimated position coordinate px. The resulting corrected coordinates are then entered into the display register 25. The correction value C is also used to reset the variable statistical factor used in the statistical limit circuit 34.

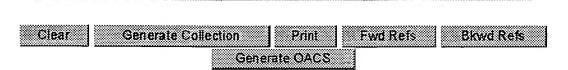
#### CLAIMS:

- 5. The method claimed in 4 which further comprises:
- (a) recording in a memory during said experimental run, an identification code for each said event in coordination with its location of occurrence coordinates;
- (b) reading at least one of said events identification code during subsequent scheduled runs from said memory according to an address margin determined in function of the estimated location coordinates held in said register combined with statistical factors which are modified in function of the current estimated accuracy of the coordinates held in said register;
- (c) comparing the identification code of the event being detected with the identification code being read out from the memory;
- (d) upon detecting similarity between said identification codes, generating a <u>correction factor</u> to be applied to the contents of said register where said <u>correction factor</u> is a continuous non-linear function of the difference between the coordinates stored in the register and the prerecorded location coordinates of the detected event.
- 9. The method claimed in 8 which further comprises:

modifying the wheel circumference <u>factor</u> used to calculate the distance travelled from the wheel revolution counters data; by a <u>correction factor</u> adjusted periodically in function of the error between said data and measurement derived from at least one other means.

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1. Document ID: US 4179739 A L3: Entry 1 of 1

File: USPT

Dec 18, 1979-

US-PAT-NO: 4179739

DOCUMENT-IDENTIFIER: US 4179739 A

TITLE: Memory controlled process for railraod traffic management

Full	Title	Citation	Front	Review	Classification	Date	Reference SERGINGES CONTROL C	laims 1600	C Draw, De
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L3: Entry 1 of 1

File: USPT

Dec 18, 1979

US-PAT-NO: 4179739

DOCUMENT-IDENTIFIER: US 4179739 A

TITLE: Memory controlled process for railraod traffic management

DATE-ISSUED: December 18, 1979

INVENTOR-INFORMATION:

NAME CI

CITY

Search Selected

STATE

ZIP CODE

COUNTRY

Virnot; Alain D.

Del Mar

CA

92014

INT-CL: [02] G06F 15/48

US-CL-ISSUED: 364/436; 246/3, 246/182R, 364/426 US-CL-CURRENT: 701/117; 246/182R, 246/3, 701/20

FIELD-OF-SEARCH: 364/436, 364/426, 364/450, 24/3, 24/4, 24/5, 24/182R, 24/187R,

24/187A

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search ALL

		2	
PAT-NO	ISSUE-DATE	PATENTEE-NAME .	US-CL
3953714	April 1976	Gabillard	364/436
3971018	July 1976	Isbister et al.	364/436
3976272	August 1976 .	Murray et al.	364/436
4023753	May 1977	Dobler	364/436
4066877	January 1978	Virnot et al.	364/426
4084241	April 1978	Tsumura	364/450

ART-UNIT: 236

PRIMARY-EXAMINER: Atkinson; Charles E.

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## Search Results -

Terms	Documents
L6 and ((correct\$ or edit\$ or chang\$) with (coefficient or factor))	0

Database:	US Pre-Grant Publication Full-Text Database US Patents Full-Text Database US OCR Full-Text Database EPO Abstracts Database JPO Abstracts Database Derwent World Patents Index IBM Technical Disclosure Bulletins		·
Search:	L7	<u> </u>	Refine Search
	Recall Text Clear		Interrupt

# Search History

DATE: Friday, May 27, 2005 Printable Copy Create Case

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<u>L6</u>	L5 and gps	1	<u>L6</u>
<u>L5</u>	4179739.urpn.	15	<u>L5</u>
<u>L4</u>	('4179739')[UŖPN]	15	<u>L4</u>
<u>L3</u>	4179739.pn.	1	<u>L3</u>
<u>L2</u>	4179739.pn. and (gps)	0	<u>L2</u>
<u>L1</u>	4179739.pn. and ((correct\$ or edit\$ or chang\$) with (coefficient or factor))	1	<u>L1</u>

END OF SEARCH HISTORY

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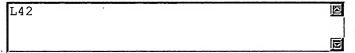
US Pre-Grant Publication Full-Text Database

US Patents Full-Text Database

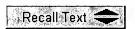
Database:

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## **Search History**

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<u>L41</u>	(3604905   3334224   3383677   3392448   3731088   3845289   3364343   3890616   2990902   3440600   3772640   3268727   3836768   3219815   3681752   3717873   3240929   3188631   3725918   3749893   3250914   3538313   3079494   3789198   3715572)![PN]	25	<u>L41</u>
<u>L40</u>	('3971018'  '4066877'  '4023753'  '3953714'  '4084241'  '3976272')[PN]	6	<u>L40</u>
<b>L</b> 39	(4023753   4084241   4066877   3976272   3971018   3953714)![PN]	6	<u>L39</u>
<u>L38</u>	('4179739')[PN]	1	<u>L38</u>
<u>L37</u>	L29 and (train\$ or locomotive) and (wheel\$ same (correct\$ with (factor or coefficient)))	1	<u>L37</u>
<u>L36</u>	L35 and (train\$ or locomotive) and (wheel\$ same (correct\$ with (factor or coefficient)))	0	<u>L36</u>

# WEST Refine Search

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7.	<u>L35</u>	L31 and @ad<=20031126	Page 2 of 3
	<u>L34</u>	('5390880'  '6141607'  '5437400"	108 <u>L35</u>
FW	<u>L33</u>	('4179739')[URPN]	108 <u>L34</u>
	<u>L32</u>	L29 and (train\$ or locomotive) and (wheel\$ same (correct\$ with (factor or	15 <u>L33</u>
	<u>L31</u>	('6775690'  '6860423'  '6697811'  '6839753'  '6790198'  '6459964'  '6662141'  '6837422'  '5828979'  '5006847'  '5798949'  '4617627'  '5440489'  '4266273')	1 <u>L32</u>
	=50	( 0408330   '4179739') IT IR PNT	108 <u>L31</u>
	<u>L29</u>	4179739.pn.	21 <u>L30</u> 1 <u>L29</u>
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